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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,419	12/31/2003	Young-A Kim	YPL-0071	9573
23413	7590	08/19/2005	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			BABIC, CHRISTOPHER M	
			ART UNIT	PAPER NUMBER
			1637	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/749,419	Applicant(s) KIM ET AL.	
	Examiner Christopher M. Babic	Art Unit 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

5-00

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, it is unclear what is meant by the phrase "a terminal of nucleic acids".

With respect to the above rejection, the arguments of the response filed July 29, 2005 on page 5 have been fully considered, but are not found to be persuasive. Applicants are correct in asserting that the terminal of a *nucleic acid* is considered the end of a *nucleic acid*, however, the language of Claim 3 fails to distinctly claim the terminal end of a *nucleic acid*.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. Claims 1-2 and 5-8 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Cantor et al (U.S. Patent 5,795,714: filed August 23, 1993: issued August 13, 1998).

Regarding claim 1, Cantor et al teach a method of replicating a nucleic acid array, the method comprising: (a) manufacturing a template nucleic acid array by immobilizing on a surface of a first substrate first nucleic acid probes (claim 1., column 53, lines 28-33), each of which includes a first polynucleotide that has a sequence complementary to a second polynucleotide to be synthesized and a primer binding site. Due to the inherent nature of polynucleotides, a first polynucleotide will have a second polynucleotide to which it will be complementary. Any sequence contained within the first nucleotide to which a polynucleotide complementary to said first nucleotide may bind may be interpreted as a primer binding site. (b) binding a primer to the primer binding site of each of the first nucleic acid probes immobilized on the surface of the first substrate of the template nucleic acid array (claim 1; column 53, lines 34-36)., (c) in-situ

synthesizing a second polynucleotide initiating from the primer using the first polynucleotide as a template (claim 1; column 53, lines 37-38)., and (d) transferring second nucleic acid probes, each of which includes the second polynucleotide and the primer, to a second substrate from the first substrate (claim 1 ; column 53, lines 40-43).

Regarding claims 2 and 11, Cantor et al teach the first and second substrates are previously surface-treated, i.e. coating the surface (column 15, lines 23-28).

Regarding claim 5 and 12, Cantor et al teach the use of universal primers, i.e., the complement of the common region (column 4, lines 26-29; column 4, lines 48-61; column 33, lines 44-46).

Regarding claim 6, Cantor et al teach attaching to a terminal of the primer one of a functional group and a material that can bind to a surface of the second substrate, e.g. streptavidin/biotin (column 15, lines 23-28).

Regarding claim 7, double-stranded DNA is held together via hydrogen bonding. Cantor et al teach denaturation of double stranded nucleic acids (column 53, line 40) and therefore teach cleaving hydrogen bonds between the first and second polynucleotides before step (d).

Regarding claim 8, Cantor et al teach repeated use of the template nucleic acid array to produce a number of nucleic acid arrays (column 14, lines 5-8).

With respect to the above rejection, the arguments and amendments of the response filed July 29, 2005 on pages 5 and 6 have been fully considered and are deemed not persuasive. Applicant argues the new limitation introduced into Claim 1, "...wherein immobilizing one of the first nucleic acid probes comprises bringing a

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protruding portion of the first substrate into contact with a solution of the first nucleic acid probe filling a recessed portion of another uneven substrate such that the first nucleic acid probe is immobilized on the surface of the protruding portion of the first substrate...”, is not taught by the applied reference. Cantor et al. teach a master array of beads able to be manipulated in microtiter plates (i.e. recessed portion of another uneven substrate) (Column 21, Lines 29-30). Furthermore, Cantor et al. teach a master array consisting of a set of streptavidin bead-impregnated plastic coated metal pins (i.e. protruding portion), each of which, at its tip, contains immobilized biotinylated DNA strands (Column 21, Lines 59-63). They teach incubating the master array with 5'-biotinylated complements of the DNA probes and synthesizing the complement with polymerase (Column 21, Lines 64-65). They teach the transfer of the newly synthesized 5'-biotinylated from the master array to the streptavidin-coated replica surface (Column 22, Lines 1-3). As such, the teachings of Cantor et al. clearly anticipate the methods as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 3-4, 9-10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantor et al (U.S. Patent 5,795,714; filed August 23, 1993; issued August 18, 1998) in-view of Dickinson et al (U.S. Patent 6,770,441: filed August 16, 2001: issued August 3, 2004).

Regarding claim 1, Cantor et al teach a method of replicating a nucleic acid array as discussed above.

Regarding claim 2, Cantor et al teach the first and second substrates are previously surface-treated, i.e. coating the surface (column 15, lines 23-28), as discussed above.

Regarding claims 3, 9-10, and 13, Cantor et al teach the use of streptavidin/biotin for the immobilization of nucleic acids to an array substrate (column 15, lines 23-28). Cantor et al do not teach a metallic pattern formed on the substrates. Dickinson et al teach the first and second substrates are previously patterned or surface-treated, i.e. metal-coated for the advantage of enhanced signal collection from the arrays (column 10, lines 18-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to combine the teachings of Dickinson et al and Cantor et al to fabricate a nucleic acid array with a metallic pattern on the substrate for the advantage of "enhanced signal collection from the arrays" (Dickinson et al, column 10, lines 18-20). Thus, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made.

Regarding claim 4, Cantor et al teach the use of streptavidin/biotin (column 15, lines 23-28).

With respect to the above rejection, the arguments and amendments of the response filed July 29, 2005 on pages 7 and 8 have been fully considered and are deemed not persuasive. Applicant argues the new limitation introduced into Claim 1, "...wherein immobilizing one of the first nucleic acid probes comprises bringing a protruding portion of the first substrate into contact with a solution of the first nucleic acid probe filling a recessed portion of another uneven substrate such that the first nucleic acid probe is immobilized on the surface of the protruding portion of the first substrate...", is not taught by the applied primary reference. As discussed in the above rejection, Cantor et al. does anticipate the new limitation introduced into Claim 1. Therefore, the combination of references properly establishes a prima facie case of obviousness.

Conclusion

No claims are allowed. No claims are free of the prior art.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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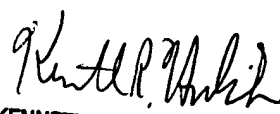
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Babic whose telephone number is 571-272-8507. The examiner can normally be reached on Monday-Friday 7:00AM to 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).




KENNETH R. HORLICK, PH.D.
PRIMARY EXAMINER

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Christopher M. Babic

Examiner

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